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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/758,977

01/14/2004

Kenneth S. McElvain

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07/05/2006

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EXAMINER

LIN, SUN J

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/758,977

Applicant(s)

MCELVAIN, KENNETH S.

Examiner

Sun J. Lin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-135 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-135 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/14/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/23/04, 7/14/05</u>  | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. This office action is in response to application 10/758,977 filed on 01/14/2004. Claims 1 – 135 remain pending in the application.

### Quayle Action

2. This application is in condition for allowance except for the following formal matters:

#### Claim Objections

- Claim 2, line 1, change "A" to **—The—**.
- Claim 2, line 2, before "redundant" insert **—plurality of—**.
- Claim 3, line 1, change "A" to **—The—**.
- Claim 4, line 1, change "A" to **—The—**.
- Claim 4, line 6, before "redundant" insert **—plurality of—**.
- Claim 5, line 1, change "A" to **—The—**.
- Claim 5, line 2, before "redundant" insert **—plurality of—**.
- Claim 6, line 1, change "A" to **—The—**.
- Claim 6, line 3, delete **—to—**.
- Claim 7, line 1, change "A" to **—The—**.
- Claim 8, line 1, change "A" to **—The—**.
- Claim 9, line 1, change "A" to **—The—**.
- Claim 10, line 1, change "A" to **—The—**.
- Claim 11, line 1, change "A" to **—The—**.
- Claim 12, line 1, change "A" to **—The—**.
- Claim 13, line 1, change "A" to **—The—**.
- Claim 14, line 1, change "A" to **—The—**.
- Claim 15, line 1, change "A" to **—The—**.
- Claim 17, line 1, change "A" to **—The—**.
- Claim 17, line 3, before "redundant" insert **—plurality of—**.
- Claim 18, line 1, change "A" to **—The—**.
- Claim 19, line 1, change "A" to **—The—**.
- Claim 19, line 5, before "redundant" insert **—plurality of—**.
- Claim 20, line 1, change "A" to **—The—**.

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Claim 20, line 3, before “redundant” insert **—plurality of—**.

Claim 21, line 1, change “A” to **—The—**.

Claim 21, line 3, change “a plurality” to **—the plurality—**.

Claim 22, line 1, change “A” to **—The—**.

Claim 23, line 1, change “A” to **—The—**.

Claim 24, line 1, change “A” to **—The—**.

Claim 25, line 1, change “A” to **—The—**.

Claim 26, line 1, change “A” to **—The—**.

Claim 27, line 1, change “A” to **—The—**.

Claim 28, line 1, change “A” to **—The—**.

Claim 29, line 1, change “A” to **—The—**.

Claim 30, line 1, change “A” to **—The—**.

Claim 32, line 1, change “A” to **—The—**.

Claim 32, line 3, before “redundant” insert **—plurality of—**.

Claim 33, line 1, change “A” to **—The—**.

Claim 34, line 1, change “A” to **—The—**.

Claim 34, line 5, before “redundant” insert **—plurality of—**.

Claim 35, line 1, change “A” to **—The—**.

Claim 35, line 3, before “redundant” insert **—plurality of—**.

Claim 36, line 1, change “A” to **—The—**.

Claim 36, line 1, change “claim 20” to **—claim 31—**.

Claim 36, line 4, change “a plurality” to **—the plurality—**.

Claim 37, line 1, change “A” to **—The—**.

Claim 38, line 1, change “A” to **—The—**.

Claim 39, line 1, change “A” to **—The—**.

Claim 40, line 1, change “A” to **—The—**.

Claim 41, line 1, change “A” to **—The—**.

Claim 42, line 1, change “A” to **—The—**.

Claim 43, line 1, change “A” to **—The—**.

Claim 44, line 1, change “A” to **—The—**.

Claim 45, line 1, change “A” to **—The—**.

Claim 47, line 1, change “A” to **—The—**.

Claim 47, line 2, before “redundant” insert **—plurality of—**.

Claim 48, line 1, change “A” to **—The—**.

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- Claim 49, line 1, change "A" to **—The—**.
- Claim 50, line 1, change "A" to **—The—**.
- Claim 50, line 2, before "redundant" insert **—plurality of—**.
- Claim 51, line 1, change "A" to **—The—**.
- Claim 51, line 4, delete **—to—**.
- Claim 52, line 1, change "A" to **—The—**.
- Claim 53, line 1, change "A" to **—The—**.
- Claim 54, line 1, change "A" to **—The—**.
- Claim 55, line 1, change "A" to **—The—**.
- Claim 56, line 1, change "A" to **—The—**.
- Claim 57, line 1, change "A" to **—The—**.
- Claim 58, line 1, change "A" to **—The—**.
- Claim 59, line 1, change "A" to **—The—**.
- Claim 60, line 1, change "A" to **—The—**.
- Claim 61, line 1, change "A" to **—The—**.
- Claim 62, line 1, change "A" to **—The—**.
- Claim 63, line 1, change "A" to **—The—**.
- Claim 64, line 1, change "A" to **—The—**.
- Claim 65, line 1, change "A" to **—The—**.
- Claim 66, line 1, change "A" to **—The—**.
- Claim 66, line 2, change "register" to **—registers—**.
- Claim 67, line 1, change "A" to **—The—**.
- Claim 68, line 1, change "A" to **—The—**.
- Claim 69, line 1, change "A" to **—The—**.
- Claim 70, line 1, change "A" to **—The—**.
- Claim 71, line 1, change "A" to **—The—**.
- Claim 72, line 1, change "A" to **—The—**.
- Claim 73, line 1, change "A" to **—The—**.
- Claim 74, line 1, change "A" to **—The—**.
- Claim 75, line 1, change "A" to **—The—**.
- Claim 77, line 1, change "A" to **—The—**.
- Claim 77, line 2, before "redundant" insert **—plurality of—**.
- Claim 78, line 1, change "A" to **—The—**.
- Claim 79, line 1, change "A" to **—The—**.

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Claim 79, line 2, before "redundant" insert **—plurality of—**.  
Claim 80, line 1, change "A" to **—The—**.  
Claim 80, line 2, before "redundant" insert **—plurality of—**.  
Claim 81, line 1, change "A" to **—The—**.  
Claim 82, line 1, change "A" to **—The—**.  
Claim 83, line 1, change "A" to **—The—**.  
Claim 84, line 1, change "A" to **—The—**.  
Claim 85, line 1, change "A" to **—The—**.  
Claim 86, line 1, change "A" to **—The—**.  
Claim 87, line 1, change "A" to **—The—**.  
Claim 88, line 1, change "A" to **—The—**.  
Claim 89, line 1, change "A" to **—The—**.  
Claim 90, line 1, change "A" to **—The—**.  
Claim 91, line 1, change "A" to **—The—**.  
Claim 92, line 1, change "A" to **—The—**.  
Claim 93, line 1, change "A" to **—The—**.  
Claim 94, line 1, change "A" to **—The—**.  
Claim 95, line 1, change "A" to **—The—**.  
Claim 96, line 1, change "A" to **—The—**.  
Claim 96, line 2, change "register" to **—registers—**.  
Claim 97, line 1, change "A" to **—The—**.  
Claim 98, line 1, change "A" to **—The—**.  
Claim 99, line 1, change "A" to **—The—**.  
Claim 100, line 1, change "A" to **—The—**.  
Claim 101, line 1, change "A" to **—The—**.  
Claim 102, line 1, change "A" to **—The—**.  
Claim 103, line 1, change "A" to **—The—**.  
Claim 104, line 1, change "A" to **—The—**.  
Claim 105, line 1, change "A" to **—The—**.  
Claim 107, line 1, change "A" to **—The—**.  
Claim 107, line 2, before "redundant" insert **—plurality of—**.  
Claim 108, line 1, change "A" to **—The—**.  
Claim 109, line 1, change "A" to **—The—**.  
Claim 109, line 6, before "redundant" insert **—plurality of—**.

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Claim 110, line 1, change "A" to ~~—The—~~.  
Claim 111, line 1, change "A" to ~~—The—~~.  
Claim 111, line 4, delete ~~—to—~~.  
Claim 112, line 1, change "A" to ~~—The—~~.  
Claim 113, line 1, change "A" to ~~—The—~~.  
Claim 114, line 1, change "A" to ~~—The—~~.  
Claim 115, line 1, change "A" to ~~—The—~~.  
Claim 116, line 1, change "A" to ~~—The—~~.  
Claim 117, line 1, change "A" to ~~—The—~~.  
Claim 118, line 1, change "A" to ~~—The—~~.  
Claim 119, line 1, change "A" to ~~—The—~~.  
Claim 120, line 1, change "A" to ~~—The—~~.  
Claim 121, line 1, change "A" to ~~—The—~~.  
Claim 122, line 1, change "A" to ~~—The—~~.  
Claim 123, line 1, change "A" to ~~—The—~~.  
Claim 124, line 1, change "A" to ~~—The—~~.  
Claim 125, line 1, change "A" to ~~—The—~~.  
Claim 126, line 1, change "A" to ~~—The—~~.  
Claim 126, line 2, change "register" to ~~—registers—~~.  
Claim 127, line 1, change "A" to ~~—The—~~.  
Claim 128, line 1, change "A" to ~~—The—~~.  
Claim 129, line 1, change "A" to ~~—The—~~.  
Claim 130, line 1, change "A" to ~~—The—~~.  
Claim 131, line 1, change "A" to ~~—The—~~.  
Claim 132, line 1, change "A" to ~~—The—~~.  
Claim 133, line 1, change "A" to ~~—The—~~.  
Claim 134, line 1, change "A" to ~~—The—~~.  
Claim 135, line 1, change "A" to ~~—The—~~.

Appropriate corrections are required.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

### Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

Claims 1 – 135 are allowed because the prior art does not teach or fairly suggest the following subject matter:

- A digital circuit with redundancy protection, the digital circuit comprising a time multiplexer to assign a plurality of redundant data into a plurality of time slots, a time-multiplexed circuit to process the plurality of redundant data in the plurality of time slots to generate a plurality of redundant results respectively, and a voting circuit to process the plurality of redundant results to maintain data integrity in combination with other limitations as recited in independent **Claim 1**;
- A method to process data on a digital circuit with redundancy protection, the method comprising assigning a plurality of redundant data into a plurality of time slots, processing the plurality of redundant data in the plurality of time slots in a time-multiplexed circuit of the digital circuit to generate a plurality of redundant results respectively, and processing the plurality of redundant results to maintain data integrity as recited in independent **Claim 16**;
- A digital circuit for data processing with redundancy protection, the digital circuit comprising means for assigning a plurality of redundant data into a plurality of time slots, means for processing the plurality of redundant data in the plurality of time slots to generate a plurality of redundant results respectively, and means for processing the plurality of redundant results to maintain data integrity as recited in independent **Claim 31**;
- A method to design a digital circuit with redundancy protection, the method comprising automatically generating a second design of a time multiplexed circuit from a first design of a single-channel circuit to process a plurality of



redundant data in a plurality time slots to generate respectively a plurality of redundant results and generating a voting circuit to process the plurality of redundant results to maintain data integrity as recited in independent **Claim 46**;

- A machine readable medium containing executable computer program instructions which when executed by a digital processing system cause said (digital processing) system to perform a method to design a digital circuit with redundancy protection, the method comprising automatically generating a second design of a time multiplexed circuit from a first design of a single-channel circuit to process a plurality of redundant data in a plurality time slots to generate respectively a plurality of redundant results and generating a voting circuit to process the plurality of redundant results to maintain data integrity as recited in independent **Claim 76**;
- A data processing system to design a digital circuit with redundancy protection, the data processing system comprising means for automatically generating a second design of a time multiplexed circuit from a first design of a single-channel circuit to process a plurality of redundant data in a plurality time slots to generate respectively a plurality of redundant results and means for generating a voting circuit to process the plurality of redundant results to maintain data integrity as recited in independent **Claim 106**.

### **Conclusion**

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Sun James Lin* whose telephone number is (571) 272 - 1899. The examiner can normally be reached on Monday-Friday 9:30AM - 6:30PM.

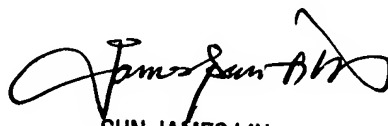
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, *Jack Chiang* can be reached on (571) 272 - 7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

All responses to this Office Action should be mailed to **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450** or faxed to **571-273-8300**.

Sun James Lin  
Primary Examiner  
Art Unit 2825  
June 19, 2006



SUN JAMES LIN  
PRIMARY EXAMINER